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phuric acid and determine the iodine set free by sodium thiosulphate. 'The Relation of Trivalent to Pentavalent Nitrogen:' By A. LACHMAN. Preliminary study of the reactions of nitrosamines. 'On Paramethoxyorthosulphobenzoic Acid and some of its Derivatives:' By P. R. MOALE. 'Decomposition of Paradiazoorthotoluenesulphonic Acid with Absolute Methyl Alcohol in the presence of certain substances:' By P. R. MOALE. The decomposition was studied in the presence of sodium methylate, ethylate, potassium hydrate, ammonia and aniline. 'Parabenzoyldiphenylsulphone and related compounds:' By L. C. NEWELL. 'The Action of Ethylic Oxalate on Camphor:' By J. B. TINGLE.

J. ELLIOTT GILPIN.

#### SOCIETIES AND ACADEMIES.

##### GEOLOGICAL SOCIETY OF WASHINGTON.

At the 77th meeting, held in Washington, D. C., on April 13, 1898, Mr. J. A. Taff, U. S. Geological Survey, discussed the 'Geology of the McAlister quadrangle.' This quadrangle covers a quarter degree in northwestern Choctaw Nation, Indian Territory. Its geology is practically a duplication of the western Arkansas coal field and older Carboniferous rocks. The coal-bearing rocks, shale, sandstone and coal occupy the northwestern half of the quadrangle and are nearly 6,500 feet thick. Two productive coal beds have been developed. One, the Hartshorn or Grady coal, is at the base, and the other, the McAlister coal, is about 1,350 feet higher in the series. Each is about four feet thick and produces a good strong coal. Sandstone, shale and limestone occur below and south of the coal-bearing rocks and have an aggregate thickness of nearly 1,800 feet. The structure is Appalachian. That of the coal field is canoe-shaped synclines and unsymmetrical anticlines. The rocks south of the coal field are greatly faulted and intensely folded. The faults are overthrust and the folds overturned toward the north. The displacement of the greater faults are estimated to be from 7,000 to 10,000 feet.

Under title, 'The Probable Age of the McAlister Coal Group,' Mr. David White presented a

synopsis of the results obtained from a study of the fossil plants of the McAlister, I. T., coal field. The flora of the Grady or Hartshorn coal he finds to indicate a reference to the 'Lower Coal-bearing Division' of Winslow, or the basal portion of the Upper Coal Measures of Branner and Smith, in Arkansas, and a stage near the base in the Allegheny Series of the Ohio-Pennsylvania bituminous regions. The plants of the McAlister coal, about fifteen hundred feet above the Grady coal, assure a correlation with the 'Upper Coal-bearing Division' of Winslow, in Arkansas, a stage, perhaps near the Lane Shales, in the lower half of the Missourian, in Arkansas, probably below the Pittsburg coal in Pennsylvania, or near coals F or G of the Northern Anthracite field. Vegetable remains, collected by Messrs. Taff and Richardson from an horizon about two thousand feet above the McAlister coal, constitute a distinctly Coal Measures flora, without any characteristic Permian species, and bespeak a remarkable expansion of the Upper Coal Measures, or Missourian, in the Indian Territory coal field, such as is perhaps comparable to the great dialation of the Lower Coal Measures in the Central Appalachian region.

The last paper was by Mr. H. W. Turner on 'The Succession of the Igneous Rocks of the Sierra Nevada.'

In Jura-trias time in the northern Sierra Nevada volcanoes poured forth acid lavas, meta-rhyolites and meta-dacites. These acid lavas were followed by more basic lavas, meta-augite-andesites (augite-porphyrates). The succession is here clearly: first, acid; second, intermediate to basic lavas. During nearly all of Cretaceous time, and perhaps also during the Eocene, the volcanic forces of the Sierra Nevada were quiescent. The first Tertiary eruptions of large volume of which there are records were rhyolite. After another but shorter period of rest, during which the rhyolitic lavas were partly eroded, the volcanoes emitted vast floods of andesite. This succession does not accord with the theory proposed by Iddings, that the first eruption of a given volcanic center are of intermediate lavas followed by lavas more acid or more basic, or both.

WM. F. MORSELL.